# The Educational Benefits of Interactive Children's Computer Games

**An Honors Thesis (HONRS 499)**

**by**

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**Abstract**

I have always benefited from the new technologies available to me as I have grown up. Unfortunately, many teachers and adults overlook these new technologies as educational tools since they simply do not know how they work or simply how to use them themselves. With the six game designs contained within my marketing proposal, I hope to overcome these obstacles and design a series of interactive tools that educators, parents, and students alike will be able to easily use and learn from. While my proposal will be directed toward the director and original design team of the proposed children's television program, I hope that educators looking to incorporate new technologies into their classrooms can also use the information held within my proposal.

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**The Educational Benefits of Interactive Children's Computer Games**

Video games have become cemented into the American culture (Squire, 2008, p. 242). Whether they are played for pleasure, for prestige or even for education, there are no indications that the world of gaming has any intention of going anywhere. For this reason as well as others, I have decided to design an educational game. A game that, in my opinion, meets not only the educational needs of those whom I have decided to spend my life teaching, but also one that applies to their need to create, explore and discover.

*"Given that games can teach people, why aren't there more fun educational games available? As an industry, we could be making games that take the boredom out of school for the next generation of students."* (DeLoura, 2001, p. 6)

## Why Games?

Before convincing you that the game that I have designed will be the correct choice as a valuable educational tool; I must first convince you that a game is even the direction in which a teacher should go. So the topic I wish to first explore is "Why Games?"

Educational gaming does more than simply make the material less boring. Rather, what they do is create a virtual learning environment. In other words, they create a system in which the student can create an identity outside of him or herself, allowing learning by trial and error and creativity to run rampant. Without fear of failing, which under normal circumstances would fall directly on the student, children are able to freely learn and express themselves. It is even noted by L.E. Woods, in the Journal of Computer Based Instruction, (1987) and again by G. R. Gibbs in his piece for the Journal of Computer

Assisted Learning in 1999 that "virtual learning environments allow for development of higher level learning and collaboration skills and improved practical reasoning" (1999).

The logic behind this is simple but interesting. More so than with a traditional teaching method, or even an in-class game, the students are forced to do two things. First, they must take in the information that the game presents, in other words, the lesson hidden within the pretense of the virtual situation. Secondly, they must also relate to and critically analyze the game itself; how to win, what is happening, and the real world applications of the virtual scenario. This is admittedly not new. Classroom games are based for the most part on the same logic. The total saturation a student can experience within a game, where every situation and environment can be virtually adjusted in great detail, is invaluable to the success of the process.

Another advantage of the virtual learning environment is the sheer motivating factor that it possesses. "Video games motivate learning by challenging and providing curiosity, beauty, fantasy, fun, and social recognition. They reach learners who do not do well in conventional settings" (Dede, 2004). This motivation comes from a variety of conditions created by the virtual environment, and extends far beyond the idea that the game is simply more entertaining than schoolwork. Michele Dickey, in her piece, "Game Design Narrative for Learning," describes these sources of motivation. She acknowledges them as "plot hooks" and "emotional proximity" (2005, p. 75).

Plot hooks are simple enough to understand, as well as a large player in much of literary theory. Dickey describes them as such, "Plot hooks are unanswered questions that keep the reader guessing; they are uncertainties that focus the attention of players by planting questions that the player feels compelled to answer" (2006, p. 251).

Emotional proximity is another means of reaching a similar goal. According to Dickey, "Emotional proximity is characterized as empathy and identification the player feels toward his or her character in a game" (2006, p.251).

Looking at it through the lens of the actual user can develop this idea. What matters more than the player and the character being similar, is that the character is relatable to the user's own experiences. For example, a student and his principal may not be alike, but a character that is like his or her principal is still relatable. This, in a way, adds to the effectiveness of the plot hooks. If the emotional proximity is established, then the plot hooks are all the more compelling to the student. The advantage, then, of compelling the player to actively continue is simple. The idea that the students seek information out of a need to continue a plot in which they have become deeply involved, not only motivates the students but provides the opportunity for them to view the search for and acquisition of knowledge as exciting, tempting, necessary and fun.

These points have illustrated the application of online gaming in the standard classroom; but there are also uncommon advantages of gaming. In 1996, John Travis wrote a piece for SCIENCE NEWS, suggesting that "Brain training video games and stretched speech may help language impaired kids and dyslexics." Travis goes on to convey that Paula Tallal, a researcher at Rutgers University had discovered a method of revamping the phonemes in the English language in such a way that those with language impairments may be able to correctly process them (p. 104). What they also found was that these children were more motivated by and learned more in this learning program when it was placed inside the virtual realm of a video game. This is not hard evidence for the utilization of

games; but, nevertheless, it is a where games have been successfully used in interesting and challenging situations.

## The Game Itself

*Our Magical World* is, first and foremost, a television program written by Matthew Bethune and Nathanial Mikulich, Ball State graduate students (2009). The story follows the lives and everyday adventures of a French speaking young magician, Pierre, and his rabbit, Lapin, who is being constantly transformed into one thing or another. The game, "Our Magical World" is a series of mini games and activities for students and parents, based on the television series.

Throughout the game, students and parents are introduced to six main characters: Pierre, Lapin, Mr. Hands, Bonnie, Clyde and Angie. Each of these characters has a concrete role in the environment. Pierre and Lapin live together in the house where the game primarily takes place. Angie is their next-door neighbor who has a part in a few of the games, and Mr. Hands is a sort of third party, a set of hands used for instructional purposes.

The game breaks down piece by piece into a series of small, simple to understand activities ranging from interactive "search and finds," spelling or vocabulary exercises to simple repetition/cognition based videos.

## Game 1 – "Magic Trick"

This mini-game is simple. Pierre explains and demonstrates, as many times as the player dictates, a few simple magic tricks to be repeated by the player on their own time. This game is interesting because it steps out of the realm of "information" and shows the

student how to do something entirely separate from coursework. It allows the students to not only learn something in a fun way, but also to learn something that is in itself entertaining. The goal is that this attitude will apply to the subject matter covered by the other games.

**Game 2 - "Souvenirs"**

Hosted again by Pierre, this game focuses on geography and world culture. One at a time, in any order, Pierre will draw a souvenir from his bag and tell the player what the object is in the language of its country of origin. He proceeds, after a small time allowed for the repetition of the word by the player, to explain the cultural background and significance of the country in question. He also gives the English word for the piece he is holding.

There would also be room in this game to ask underlying background questions about the object. "What color it the souvenir?" "What shape it is?" "How much might it weigh?" "How much might it cost?" Some open-ended questions could be added, with approximately 30-second gaps and no correct answer. These questions would promote higher-level cognitive thinking, as dictated under Dr. Benjamin Bloom's work, commonly referred to as *Bloom's Taxonomy* (1956). Questions such as; "Decide what the shop looked like where Pierre bought this item," as well as, "Pretend you are Lapin. What would you say to Pierre?" would portray this model.

This game is informative; but, what it lacks in interactivity, it makes up for in the creation of an interesting learning environment. The player doesn't know what piece is next, or from where in the world it may originate. It also gives depth to the characters,

informing the player about their lives and adventures prior to the game and what they have done and seen in their own travels around the world.

**Game 3 – "Search and Find Lapin"**

This game involves both Lapin and Pierre. Pierre has transformed Lapin into some object, but now cannot find him. After the premise is explained, the player will move the mouse around the room looking for Lapin. He will have one ear showing. Once the player hovers over him, the object will sparkle, indicating that the player has found him and that they should click this object. Once they have found him, the game is completed and can be repeated with different scenarios as many times as desired.

The goal here is to provide an interdisciplinary approach to learning. In the process of attempting to find Lapin during the game, students are asked to perform a series of tasks that incorporate English Language Arts (ELA), Science, and Art in order to complete the game. First and foremost, students are asked to understand and follow directions, a fundamental ELA standard. Students are also asked to discriminate between several different objects in order to find Lapin. This process involves both Science and Art, as students are asked to identify simple images and take note of the differences in objects.

**Game 4 – "Track Pierre and Lapin Across the World"**

This game features Pierre and Lapin's neighbors, Bonnie and Clyde, and is focused mainly on geographical information. The setup is: the player finds the computer in the room and clicks it. When the screen comes up, it will have an interactive map of the world displayed. As the player moves the mouse around the map, some parts will light up

indicating that it is available to be clicked on. As they click on each highlighted area, the voiceovers of Bonnie and Clyde will indicate what country or region they have clicked on, and provide the user with a couple of simple, common-knowledge facts about the region.

The voiceovers will continue to indicate that these are all places that Pierre and Lapin have traveled, and all of the facts will make reference to the main characters in some way or another. This game has strong ties to Social Studies, more specifically Geography. Helping students to become familiar with maps and globes as representations of Earth, this game also encourages learning some basic history of a region. The game also holds the potential to stimulate further research from the students as they may take an interest in a specific region.

**Game 5 – "What is Mr. Hands Making Today?"**

This game features the character Mr. Hands, making all sorts of things out of balloons; for example, a giraffe, a dog, a chair, a plant, etc. Once the figure has been made, the voiceover of Mr. Hands will indicate what he has made in English and call for the player to repeat it back to him. After approximately 15-seconds of repeat time has been allotted, Mr. Hands informs the player that they will now be saying this word in different languages, and that he wants them to repeat after him.

At this point the balloon figure will disappear and become a distinguishable representation of whatever the figure may have been. These pictures will be placed in different settings according to what language Mr. Hands will speak next. For example, if the balloon figure was a dog and now we are going to say that in French, there may appear a

picture of a real dog wearing a beret, or if it was a chair, an image of a chair beneath the Eiffel tower.

The goal of this game is to take an interdisciplinary approach in establishing a basis on which a contextual framework can be built. Allowing students to see familiar objects in a possibly unfamiliar setting, along with hearing a word in a new language, should help students build knowledge of context clues. Providing an engaging environment for students to expand their knowledge of the world, will only add to the experiences students base their understanding of the world off of, enabling an easier acquisition of new information in nearly all subjects.

**Game 6 – "House Sitting for Pierre"**

In this game, Angie is watching Pierre and Lapin's home while they are away and she has a couple of things she wants to do for them. The player will first be introduced to Angie and to the premise of the game in a voice over by Angie.

What Angie wants to do for Pierre and Lapin is help them arrange the items in their refrigerator. The game begins with the refrigerator opening and revealing a multitude of different foods. Angie proceeds to tell the player that Pierre and Lapin like vegetables most and asks them to indicate which items in the refrigerator are vegetables. It is important to note that incorrect answers are replied to by Angie with a "try again," NEVER an "incorrect" or "wrong."

Once the player has selected all of the vegetables, the option to continue will be presented by Angie. This time the indicated vegetables are the only items on the screen and

the player will be asked to put them in alphabetical order. If the player takes no action, then Angie will assist them via voiceovers as well as highlighted items as prompts.

The goal of this game is simply to have the child sort objects based on different characteristics. Building on ELA, Science, and Art, this game promotes a variety of subjects as children are asked to not only classify objects based on colors and shapes, but also under less conspicuous classifications such as fruits and vegetables. This builds on students' problem solving abilities, students must think about each of the objects and compare and classify each of them based on what they already know about each category.

**WHY THIS GAME?**

According to W. Winn (2002), technology in education has developed over time and has created in its past four major eras: the "age of instruction (cognitive based design), the age of message design (design of research and media delivery), the age of simulations, and most recently the age of "learning environments."

This progression makes sense in that each new era is not a revolution, but a development from its predecessor. This game not only follows this continuum, but also is careful to contain within it shining elements from each era.

Mini games such as "Magic Trick" focus on the instructional technique. They show, without real interaction, the student how to do something that they can repeat at a later time. This sets a tone for the rest of the games. This instruction reminds the student, even if it may be subconsciously, that this is a learning environment in a classical sense. This may be especially effective for those students who do in fact seem to do well in a conventional classroom setting.

Simulations are ever present in "Our Magical World." "Tracking Pierre and Lapin across the World" is a good example. When the student has the chance to interact with someone who seems to be traveling, or working or even studying, the student has the chance to in a sense, go along with him or her. In a simulation, interaction is physical but it is also cognitive. The student in this case rides along with the instructor. They practice; the most natural and innate method of learning, and through that practice they construct a virtual variety of situations and a variety ways in which to interact with those situations. This technique provides a well-rounded educational experience without immersing the student so completely, that the line between study and reality are blurred.

This game on the other hand does in fact create a learning environment. By inviting the student into the lives of Pierre, Lapin, and their neighbors, the game sets up an entire world of accepted norms and behaviors. This creates something separate from reality, or rather its own entirely virtual reality. The game creates this environment and uses its advantages effectively in several instances.

"Track Pierre and Lapin around the World," and much more so, "House Sitting for Pierre," both work to create an immersive learning environment. These mini games describe the world around the player in great detail, by physically walking them through Pierre's home, or involving the player in a back-story that is understood to have actually happened and continue to do so in this reality.

The creation of a learning environment is used in this game to take the image that the students have gained over the years about learning and schoolwork out of the picture. If the game layers on the out of this world imagery and story line (keep in mind the main characters are a magician and a talking rabbit) then the student in his or her mind gets

further and further from the classroom and the barriers to actual learning that that setting may present.

The learning environment in this game, particularly due to its literal, inviting nature and its tendency to allow the player to do a service for the main characters, allows the player to create his or her own role in the story. If the player is involved in the day to day actions of these characters' lives then it is not out of the question to say that the action they take daily seem to be of a similar environment. Therefore, the link between the environments has the potential to be learned from as well. It is this universal applicability that I believe puts this game into a somewhat smaller, somewhat more advanced era; a "sub-era" of learning environments that I call *expandable learning environments.*

An *expandable learning environment* would be a learning environment that first allows the player to directly apply the actions taken in the game to real life scenarios, while simultaneously allowing them to construct new scenarios from that framework and, later, apply them to their everyday education. However, this is not enough. To truly add its piece to the ever evolving education paradigm, an *expandable learning environment* would also encourage the student to do something that only play can; the creation purely hypothetical, though incredibly imaginative back stories for each and every interaction. In other words, the games provide a start and an endpoint for all items or persons that the player interacts with, and also hints at the "plot hooks," forcing the player to fill in the holes (Dickey, 2005, p. 75).

For example, within the game "Our Magical World," the players are exposed, and hopefully buy into, a number of scenes that encourage real-life applications. The game

"Souvenirs" calls upon the player to know shapes, sizes, and weights. However, this is only the first level.

Next, the player is introduced to the story of that object, but only where it came from, what it is for, and where it is now. The question of how it came to be here, or how it will be used from this point is drawn out of the student through the nature of the environment, stimulating creative thinking.

The game, "Track Pierre and Lapin around the World" is also a great example. Providing the student with information such as how long it takes on a plane to get from Point A to Point B, or even providing them with pictures of the region, lead them to think about what they would do if they were there (or how they would feel on their way). These *expandable learning environments* encourage the players to actually step away from the game for a moment and apply their new knowledge immediately before they go on to the next activity. This enforces the principles of repetition and application, and contributes to a more full and defined learning experience.

No matter the value of the full experience provided, it is necessary to state one absolute fact. This, or any other educational game does not, and I believe will never, serve as a full curriculum. These games are designed as clips of specific information. Though they are good at being applied across a full spectrum of situations, there is no background knowledge without concrete, real-life experiences, first. The game may teach the users how to apply their knowledge, but it leaves it up to them to decide which path to take in achieving this. Freedom to learn in the way one feels, fits an individual style of learning, and is a good thing much of the time, but is not an absolute method. There are no absolute methods, but as it stands, games are a supplement to a well-rounded and full curriculum.

Virtual games, and the environments that they create do, without a doubt, have their place in today's classroom setting. The benefits they offer are only beginning to be fully realized.

## Next Steps

A general overview of the next steps after this development phase includes several short-term and long range plans.

The approximate cost of design has been $1,500 (@$20.00 per hour minimum). These costs would need to be included in any start up plan financing.

Since development has been accomplished, the next step is small-scale production. The approximate cost would be $4,000, not including the original design cost. I would like to pilot this product in a familiar school in which I have built rapport with the school administration. That would involve some travel and money for time spent. That approximate cost is $1,500. That is coupled with the probable start up cost for initial marketing of these games (including flyers, postage when necessary, time for calls to potential school districts, mileage to do workshops and workshop materials). The total start up cost would be approximately $7,000.

Then, the time schedule from a small initial production and pilot point is concentrated on identifying the target market. Once that has been accomplished, I would then concentrate on obtaining funds to begin a Phase 1 marketing effort. Marketing will be accomplished in five general phases. Phase 1 (one or two school boards in urban markets), move to Phase 2 (targeting districts in the East Central Indiana region), Phase 3 (targeting a full state); Phase 4 (targeting multi-state region...e.g., the Midwest) and then Phase 5 (moving into the entire US market).

Given the nature of the environment in which these games would be used and the lack of competition currently, I believe that production, initial piloting and phased marketing can be accomplished in approximately two years. Since technologies change at such a quick pace, shortening that time would always be a desirable goal.

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